

**BIOMEDICAL & VETERINARY SCIENCES
GRADUATE PROGRAM**



ANNOUNCES

The Doctor of Philosophy Seminar and Examination of

Betsy A Schroeder, DVM MPH
**“Finding Typhoid Mary: Identifying Latent Carriers of
Salmonella enterica serovar Typhimurium”**

Friday, August 14th, 2020

9:00 am

Classroom 121

Zoom link: <https://pshealth.zoom.us/j/95600599634>

Bio



Betsy Schroeder grew up in Johnstown, PA. She attended the University of Notre Dame, where she majored in biological sciences, and then obtained a Master's of Public Health in epidemiology from the University of Minnesota. Betsy then moved to Atlanta to work for the Centers for Disease Control and Prevention (CDC) in the Division of Global Migration and Quarantine. While there, she worked on the H1N1 pandemic. After working at the CDC for three years Betsy made the decision to go back to school yet again. She went to the Virginia-Maryland College of Veterinary Medicine and entered their dual degree program to obtain both a Doctor of Veterinary Medicine and a Ph.D. While at Virginia Tech, she studied intracellular bacterial infections and focused on veterinary public health.

While in vet school, Betsy received the CDC's Hubert Global Health Fellowship Award and through that was able to travel to Ethiopia and Chile to help set up rabies control and surveillance programs. After graduation, Betsy went back to work for the CDC as an Epidemic Intelligence Service (EIS) Officer, which is a two year post-graduate fellowship in applied epidemiology. As an EIS Officer, Betsy was assigned to work at the Indiana State Department of Health where she worked on projects responding to the opioid epidemic, a mass bat exposure in a sorority house, the Zika virus pandemic in Puerto Rico, and several others. When the EIS fellowship ended, Betsy came back to Pennsylvania to work as the state public health veterinarian for the Pennsylvania Department of Health. In her current role Betsy has worked on outbreaks of bacterial infections in raw milk and food, lung injury related to vaping, mosquito and tick borne illnesses, and is currently working on the COVID-19 response.

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Lay Language Abstract

Salmonella enterica serovar Typhimurium (*S. Typhimurium*) is an important human pathogen. Determining the true number of cases of salmonellosis is made more difficult because of the presence of a carrier state. These carriers are animals and humans that carry the pathogens for a variable period of time without showing any clinical signs. Identifying these latent carriers of chronic infections is vital to preventing such disease transmission and creating avenues for novel control and treatments. In my dissertation research, we looked at genetic markers from an offshoot of the TCA cycle, the glyoxylate pathway. We used these markers to test the hypothesis that these glyoxylate pathway genes would be upregulated in latent *S. Typhimurium* infections. Our research involved developing a cell culture model, then using the results from the cell culture model to inform a mouse model, and then a cattle lymph node diagnostic study. The cell culture model indicated that the gene for isocitrate lyase, *aceA*, is significantly upregulated compared to housekeeping genes. We found the presence of *aceA* in chronically infected mice, as well as cattle lymph node samples. Further research is necessary, but these results demonstrate some of the advantages of using genetic primers to identify latent *Salmonella* infections in clinically normal cattle.

Publications

Schroeder BA and Sririganathan N. “Differentiation of Acute and Latent Salmonella Infection in Cattle Using the Glyoxylate Pathway Gene *aceA*, Flagellar Gene *fimA*, and an Attempt at Validation by Bacterial Culture.” MRJI, 26(3): 1-7, 2018.

Beard CB, Occi J, Bonilla DL, Egizi AM, Fonseca DM, Mertins JW, Backenson BP, Bajwa WI, Barbarin AM, Bertone MA, Brown J, Connally NP, Connell ND, Eisen RJ, Falco RC, James AM, Krell RK, Lahmers K, Lewis N, Little SE, Neault M, Pérez de León AA, Randall AR, Ruder MG, Saleh MN, Schappach BL, **Schroeder BA**, Seraphin LL, Wehtje M, Wormser GP, Yabsley MJ, Halperin W. “Multistate Infestation with the Exotic Disease-Vector Tick *Haemaphysalis longicornis* - United States, August 2017-September 2018.” MMWR Morb Mortal Wkly Rep. 2018 Nov 30;67(47):1310-1313.

Krishnasamy V, Stevenson L, Koski L, Mellis M, **Schroeder B**, et al. Notes from the Field: Investigation of an Outbreak of Salmonella Paratyphi B Variant L(+) tartrate + (Java) Associated with Ball Python Exposure — United States, 2017. MMWR Morb Mortal Wkly Rep 2018;67:562–563

Schroeder BA, Boland A, Pieracci EG, Blanton JD, Peterson B, Brown J. “Notes from the Field: Assessment of rabies Exposure Risk in Residents of a University Sorority House – Indiana, February 2017.” MMWR Mor Mortal Wkly Rep 2018;67:166..

Pieracci EG, **Schroeder BA**, Mengistu A, Melaku A, Shiferaw M, Blanton JD, Wallace R. “Notes from the Field: Assessment of Health Facilities for Control of Canine Rabies – Gondar City, Amhara Region, Ethiopia, 2015.” MMWR Morb Mortal Wkly Rep 2016; 65:456-7.

Linkau EW, Sinclair JW, **Schroeder BA**, Galland GG, Marano, N. “Public Health Implications of Changing Rodent Importation Patterns – United States, 1999-2013.” Transbound Emerg Dis, 64:528-37.

Ma S, **Schroeder B**, Sun C, Loufakis DN, Cao Z, Sriranganathan N, Lu C. “Electroporation-based delivery of cell-penetrating peptide conjugates of peptide nucleic acids for antisense inhibition of intracellular bacteria.” *Integr Biol (Camb)*. 2014 Aug 27.

Presentations

June 2018: Oral Presentation: “The Importance of Laboratory Confirmation of Human Orf Virus Infection – A Case Report” at Council of State and Territorial Epidemiologist Annual Conference, West Palm Beach, FL.

April 2018: Oral Presentation: “Assessment of Rabies Exposure Risk Among Residents of University Sorority – Indiana, 2017” at Epidemic Intelligence Service Conference, Atlanta, GA.

January 2018: Oral Presentation: “Investigating Mass Bat Exposures: I’ve Got 99 Problems and They’re All Bats” at Tuesday Morning Seminar, Centers for Disease Control and Prevention, Atlanta, GA.

June 2017: Oral Presentation: “Electronic Reporting of Rabies Post-Exposure Prophylaxis Compared to Syndromic Surveillance – Indiana, 2015” at Council of State and Territorial Epidemiologist Annual Conference, Boise, ID.

September 2011: Poster Presentation: “Use of Peptide Nucleic Acids to Inhibit Epithelial Cell Invasion and Growth by *Salmonella enterica enterica* serovar Typhimurium” at Virginia Maryland Regional College of Veterinary Medicine Biomedical and Veterinary Science Conference, Blacksburg, VA.

March 2011: Poster Presentation: “Use of Peptide Nucleic Acid to Inhibit Epithelial Cell Invasion by *Salmonella enterica enterica* serovar Typhimurium” at Virginia Tech Graduate Student Association Conference, Blacksburg, VA.

Awards and Academic Achievements

- Phi Zeta national veterinary medicine honor society (2016)
- Hubert Global Health fellow (2015)
- Gamma Sigma Delta national agriculture honor society (2015)
- Sports Jeopardy! Champion (2014)
- Student Chapter of the American Veterinary Medical Association (SCAVMA) President (2014-2015)
- Omicron Delta Kappa national leadership honors society (2013)
- One day Jeopardy! Champion (2012)

Examination Graduate Committee

Major Advisor/Chair:

Dr. Nammalwar Sriranganathan, BVSc, MVSc, PhD, Diplomate, ACVM
Professor
Department of Biomedical Sciences and Pathobiology

Graduate Advising Committee Members:

William Huckle, MS, PhD
Associate Professor
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Sharon Witonsky, DVM, PhD, Diplomate ACVIM
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Fred Bull Professor of Chemical Engineering
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